

Patterns, Please

-

A *Papers, Please* Prototype

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Overview

- Game: Patterns, Please
- Team Members:
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Project Management

[Team Log](#)

[Trello](#)

[Playthrough Video](#)

Quick Facts

Genre: Puzzle, Simulation

Platform: PC, Tabletop

Short Game Synopsis:

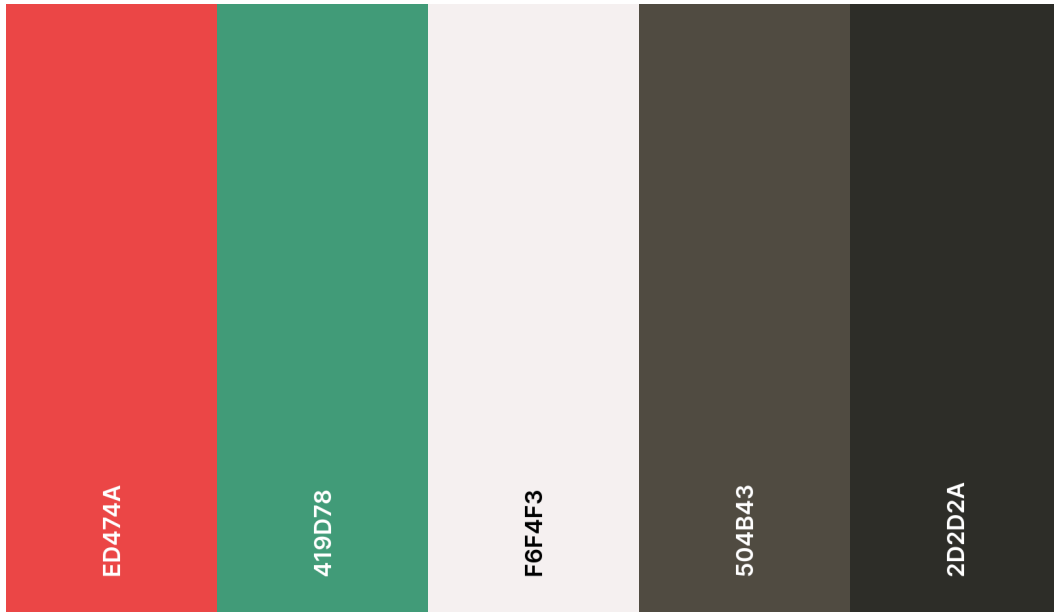
Papers, Please is a simulation game where players play the role of an immigration officer at a border checkpoint. The goal is to manage the influx of immigrants by inspecting documents and making critical decisions about who to let in while balancing pressures such as family survival.

Patterns, Please is a prototype for Papers, Please that seeks to explore and validate the gameplay experience of pattern checking under time pressure and the visual aesthetic of an oppressive dystopian where people are no more than the series of abstract text/symbols that summarizes them. Narratively, you play as an immigration desk clerk who processes incoming visa applications.

Design & Prototype

Visual Design

Color Palette



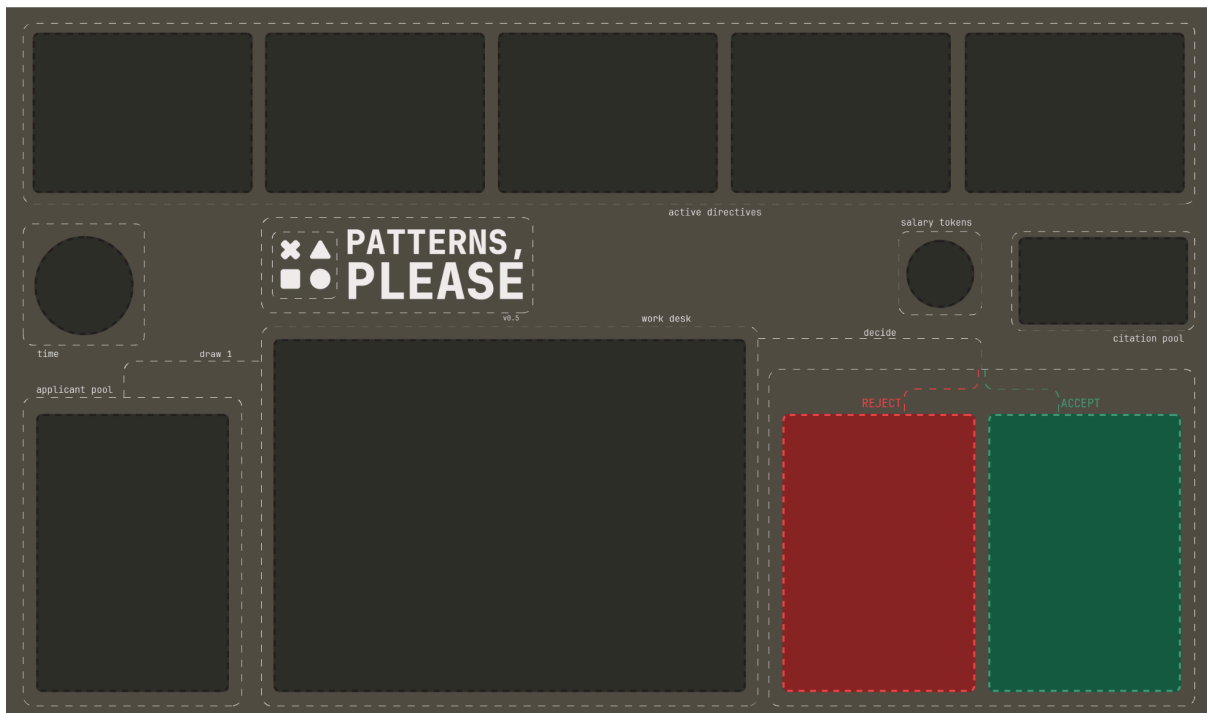
Color Palette of Patterns, Please



Gameplay Screenshot of Papers, Please

The Color palette of the original game was modified to suit a more minimalistic design while preserving the artistic direction and the dystopian aesthetic. We chose a softer shade of black and white (Jet, White Smoke) to relieve visual strain.

Board Design



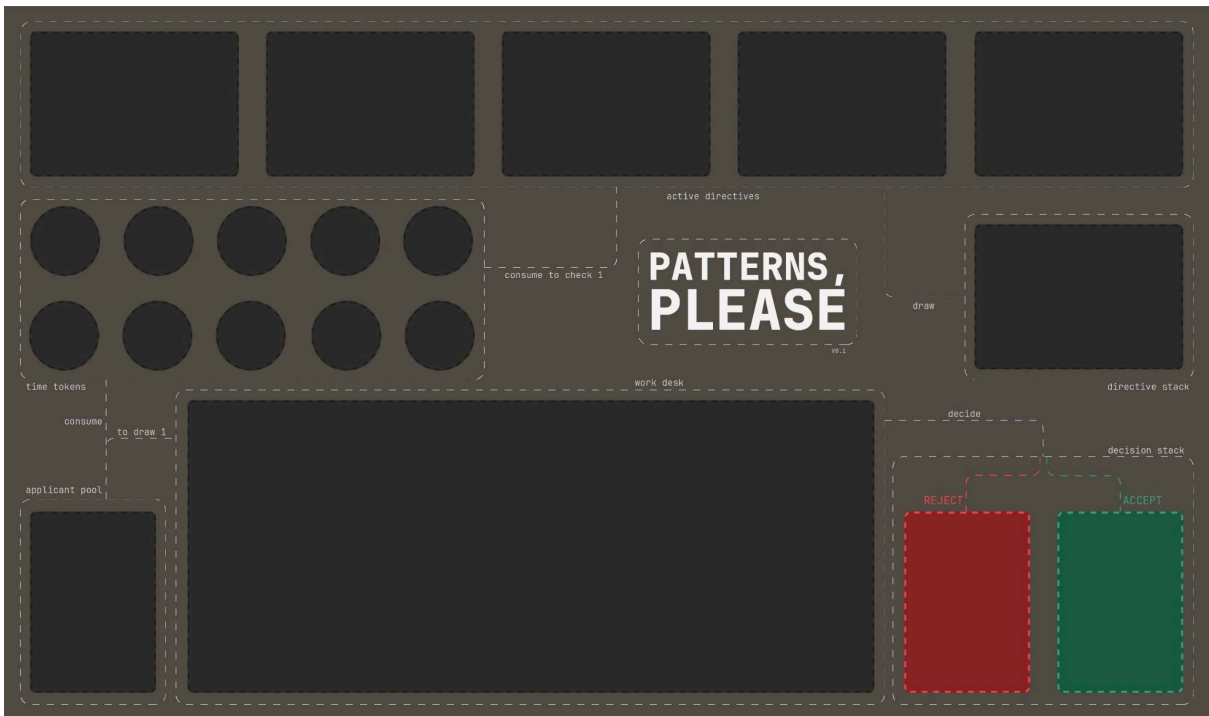
Final Board Design of Patterns, Please

We designed the board to preserve the oppressive feeling of the cubicle in the original game. Dashed lines, similar to the interrogate feature in the original game, are used to describe the function of different areas and provide hints to the flow of the game. The applicant comes from the left side, is processed at the work desk in the middle, and is placed in one of the colored decision piles on the right.

The final iteration of the board design maximizes accessibility. The sizes of all elements are increased. The size of the applicant cards increased by 135% over the first version.

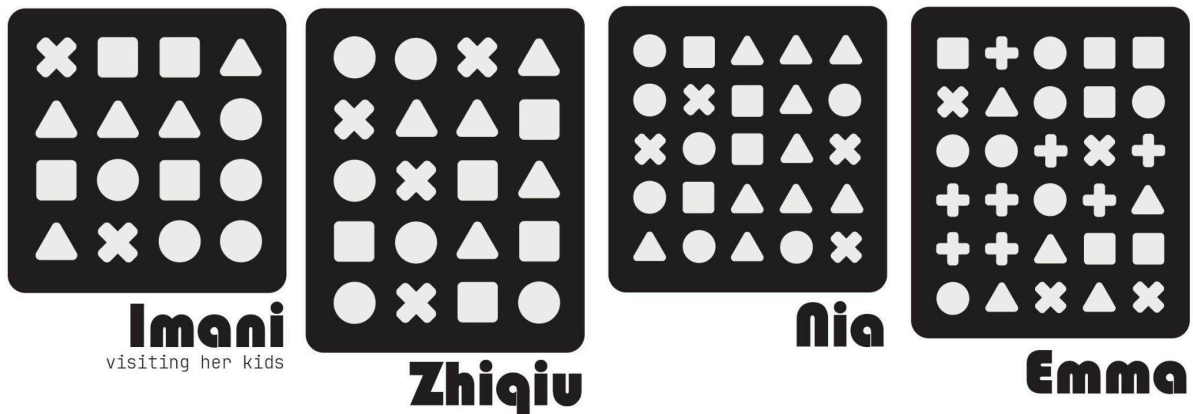


Interrogation feature of Papers: Please



First iteration of the board to be used in playtesting

Card Designs



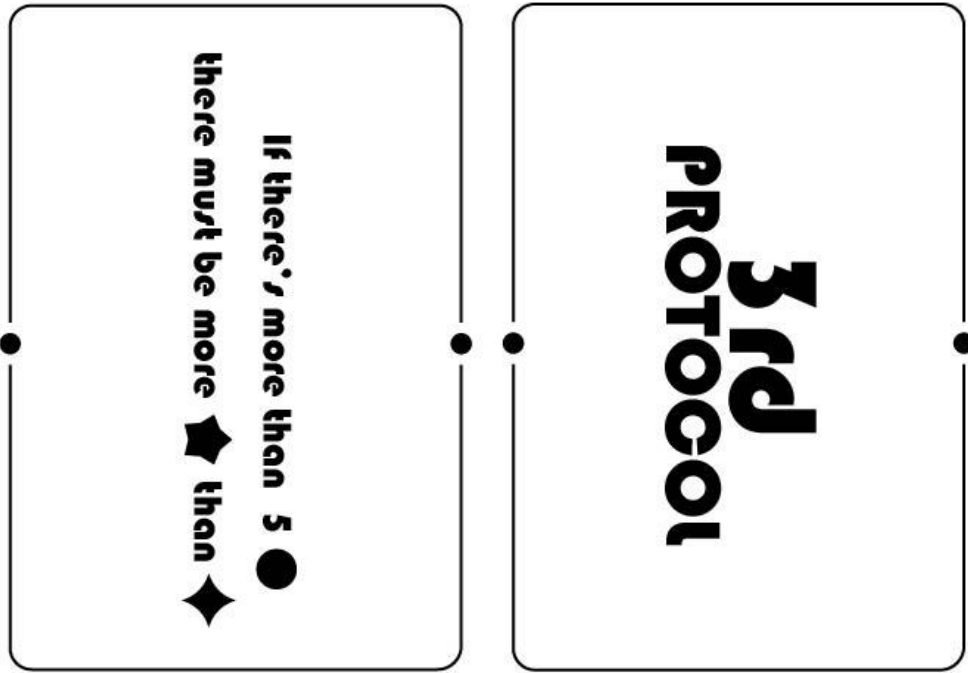
The final design of the applicant cards

The applicant cards contain as little distraction from the pattern-checking gameplay as possible. Each card contains the name of the applicant and their pattern, which is an abstraction of the document they would produce in the original game. Some cards also include a line of backstory under the applicant's name to elicit emotional responses in the player and present a moral dilemma.

VALID
APPLICANT

INVALID
APPLICANT

Validation hints are printed on the back of each applicant card so that the player can verify their decision quickly.



The protocol cards

The protocol cards represent the rules and regulations in the original game. Rules are written on the front, while the protocol numbers are on the back.



The symbols

The symbols that make up the patterns on both types of cards are chosen for their familiarity and readability. To increase the challenge in level 2, the rightmost '+' symbol is introduced due to its similarity to the 'x' symbol.

Miscellaneous



From left: Citations, Applicant Deck Cover, Salary Token(front), (back)

The citation slip was taken directly from the original game with slight modifications to the text.


Due to the validation note on the back of each applicant card, the deck has to be placed facing up. We designed a cover card to prevent the player from checking the cards before the start of each level and provide an easy way to mark the deck for each level.


The salary token keeps track of player scores with different values on the front and back.

Conceptualization

We used a FigJam board to brainstorm and deconstruct the original game, extracting what we believed to be the core aesthetic and dynamics it provided to players. We then identified the aesthetics we wanted to test with our prototype.

Next, we began working on writing the game analysis document. At the start, each team member had their own understanding of the game, leading to a variety of directions. Here are some of our initial ideas:

Zhaoze:  Concept: A Cooperative Border Control Game

Zhuowen:  PaperPlz-Analysis

Libuyu:  Papers_Libuyu

We combined our ideas and, following a meeting, presented a clearer concept.

MDA

Papers, Please

Aesthetics	Dynamics	Mechanics
<p>Submission: performing repetitive and mundane tasks</p>	<ul style="list-style-type: none"> - The player compares the name on the passport, work permit, and transit permit and makes sure they match. - The player notices a typo in the issuing city of the passport and stamps "rejected." 	<ul style="list-style-type: none"> - Document checking - Rule book - Stamping - fingerprint
<p>Stress: achieve difficult goals and make quick decisions under restrictions</p>	<ul style="list-style-type: none"> - The player scanned all documents to ensure they checked out, only to find out later, through a citation, that the name of the issuing city was misspelled. - The player chooses to go by their memory of the valid issue cities for Impor rather than checking the rulebook, risking a citation to save time. 	<ul style="list-style-type: none"> - Time pressure - Memory - Quantity of rules - Citations
<p>Dilemma: struggle to balance personal ideas and harsh realities</p>	<ul style="list-style-type: none"> - The player reluctantly rejects a husband separated from his wife to prevent pay deductions. - The player admits a resistance fighter despite them having invalid papers, furthering their cause but taking a pay deduction. 	<ul style="list-style-type: none"> - Moral dilemmas - Capacity (health bar, lose condition, money) - Story progression - Interrogation - Narrative

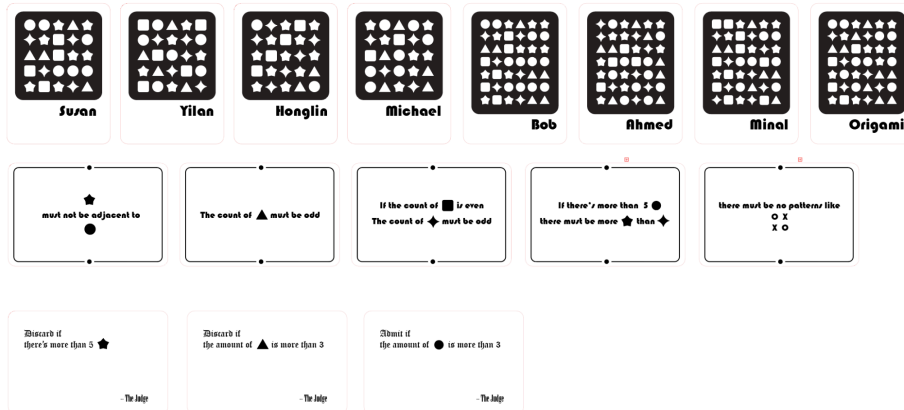
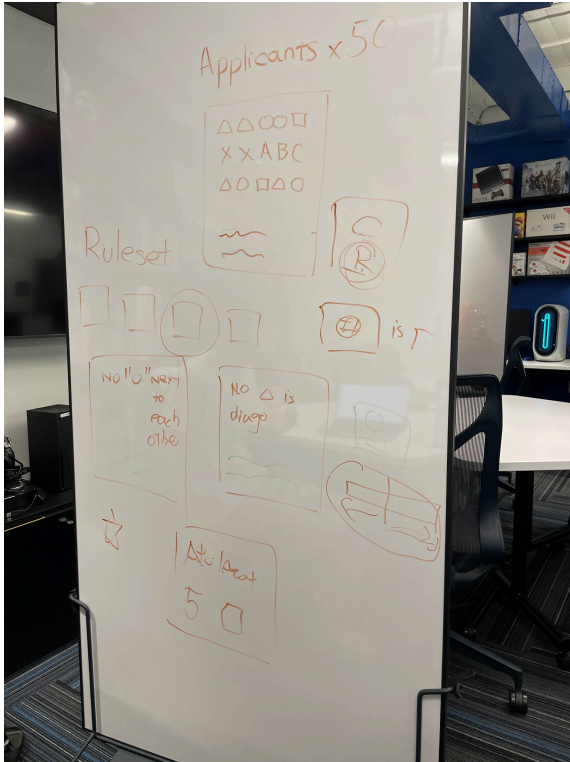
Patterns, Please

With this prototype, we choose to primarily explore and examine two out of the three aesthetics identified in the original game. The narrative and dilemma of the original game are presented through the sterile, oppressive visual design and the backstory of the prototype.

Aesthetics	Dynamics	Mechanics
<p>Submission: performing repetitive and mundane tasks</p>	<ul style="list-style-type: none"> - The player reads the symbols on the applicant card carefully to see if they conform to all the rules. - The player carefully moves the applicant card to a decision pile, and the card flips over automatically to show if they made the right decision. 	<ul style="list-style-type: none"> - Pattern checking - Moving Cards - Card Auto flip
<p>Stress: achieve difficult goals and make quick decisions under restrictions</p>	<ul style="list-style-type: none"> - The player struggles to read the complex and numerous symbols in the pattern quickly and forgets about one of the rules in the meantime. - The player chooses not to waste time double-checking the rule cards and places the applicant in the accept decision pile, resulting in a wrong decision. 	<ul style="list-style-type: none"> - Hourglass - Remembering Rules - Quantity of symbols - Citations

Laser-Cut Prototype

In the initial prototyping phase, we aimed to "keep it simple enough to balance while preserving the essence of the game." We produced a laser-cut prototype to validate the pattern-checking gameplay and acquire exploratory results for balancing and difficulty.

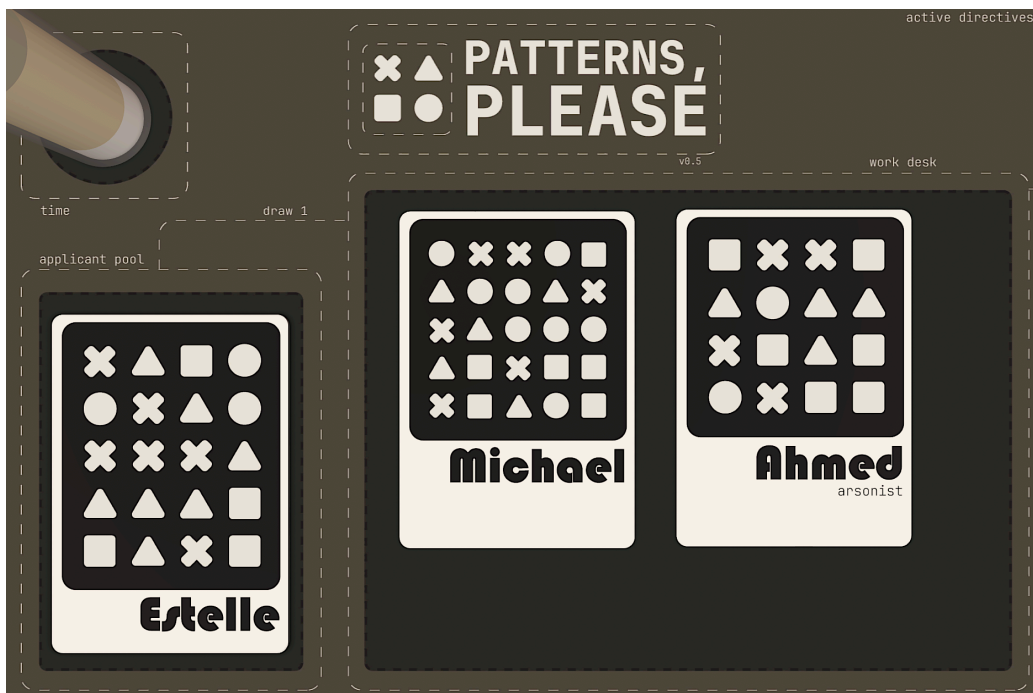


Concept & Abstraction

Overall, we used a guiding principle to unify our design philosophy: abstract specific information and isolate gameplay elements that impact the MDA of the original game to recreate them.

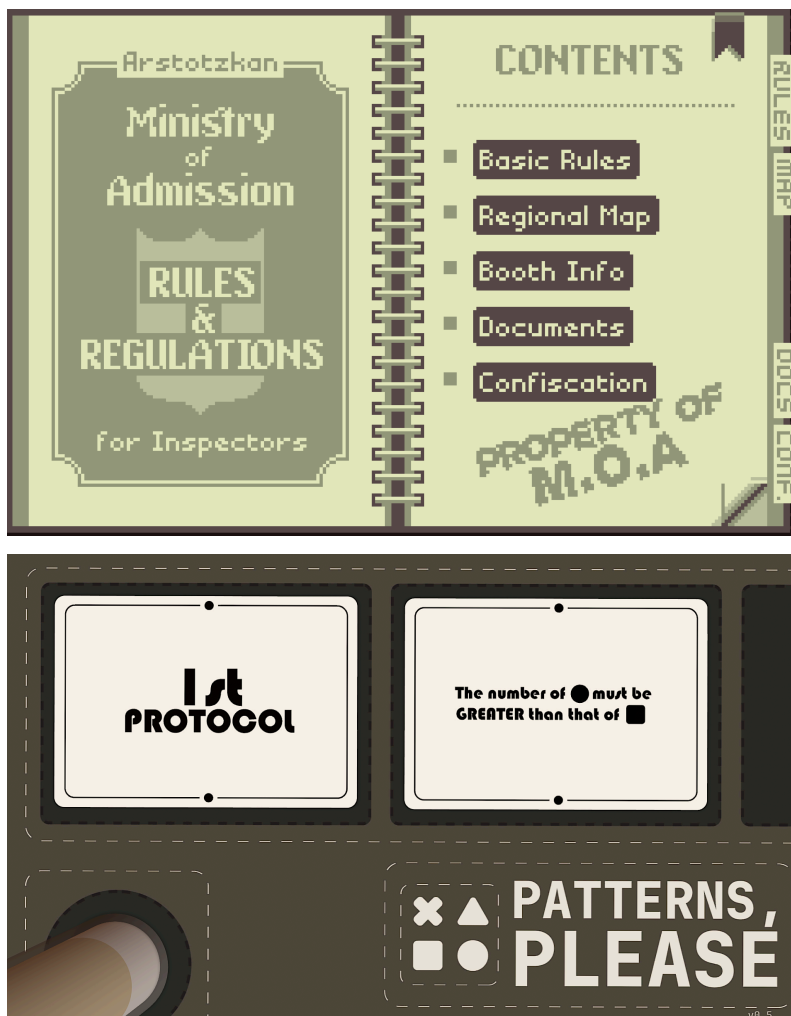
Information/Narrative

In the original game, NPCs applying for entry usually bring documents for inspection containing extensive information. We ultimately agreed to abstract this information by using shapes as substitutes for a minimal prototype aimed at showcasing gameplay and achieving balance. Different combinations of shapes could represent various aspects such as nationality, date of birth, gender, and body type. Documents like passports and entry permits were also abstracted into a single pattern. For replicating the playability of checking documents, these abstract concepts don't differ fundamentally from specific details.



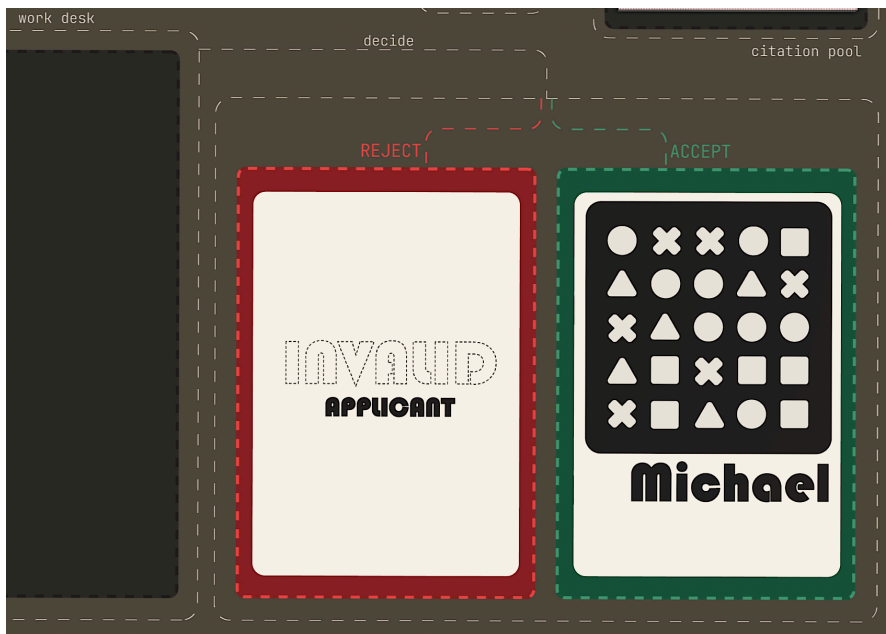
Rules

Similarly, in the original game, the player must follow various rules. Some of these rules are communicated through subtitles, some are conveyed verbally by NPCs, and others are written in the work rulebook, which players need to browse. Staying true to our principles we abstracted these concepts and transformed them into cards. Once the timer starts, players must place the rule cards face down. If a player needs to recheck a rule, they can flip a card, but they are not allowed to touch any other cards; once finished, the card must be placed face down again. This abstracted rule represents the actions in the game, like flipping through a rulebook or referring to notes with rules. Since the original game's desk is small, players need to put these rule cards away after checking them. In our initial concept, this is a second-level difficulty interaction, as it requires players to complete multiple actions.



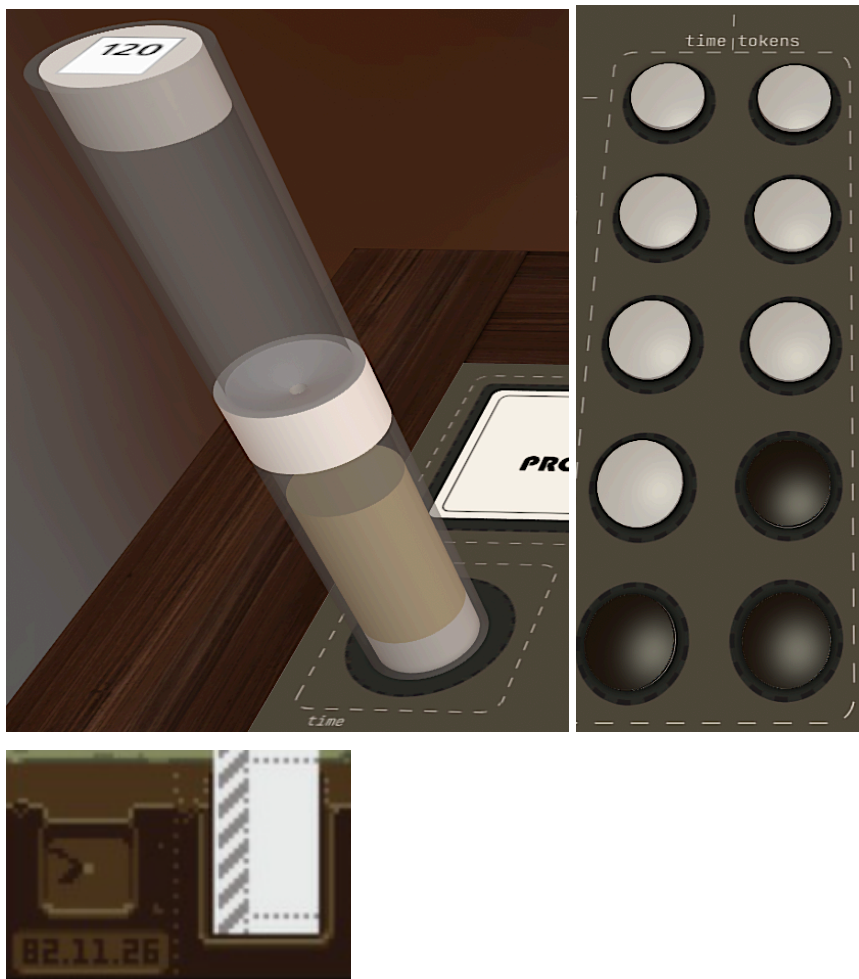
Checking

In the original game, the core gameplay revolves around information checking. We haven't made significant changes to this aspect; players still need to check if patterns align with the rules, staying the same as the game's mechanics. The main difference is that instead of using stamps, players place cards directly.



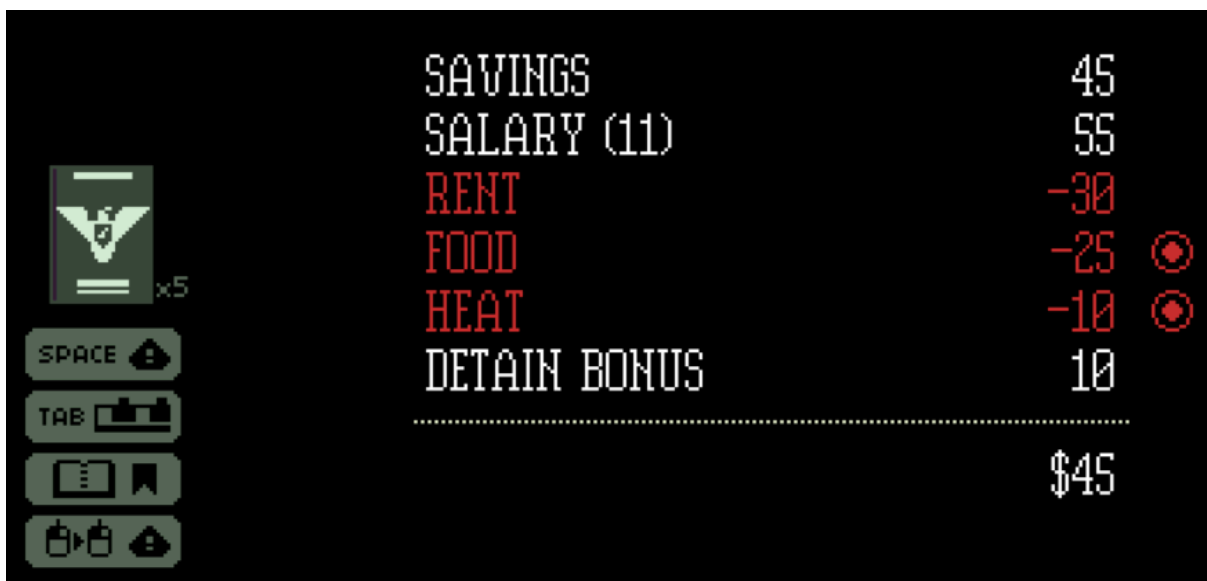
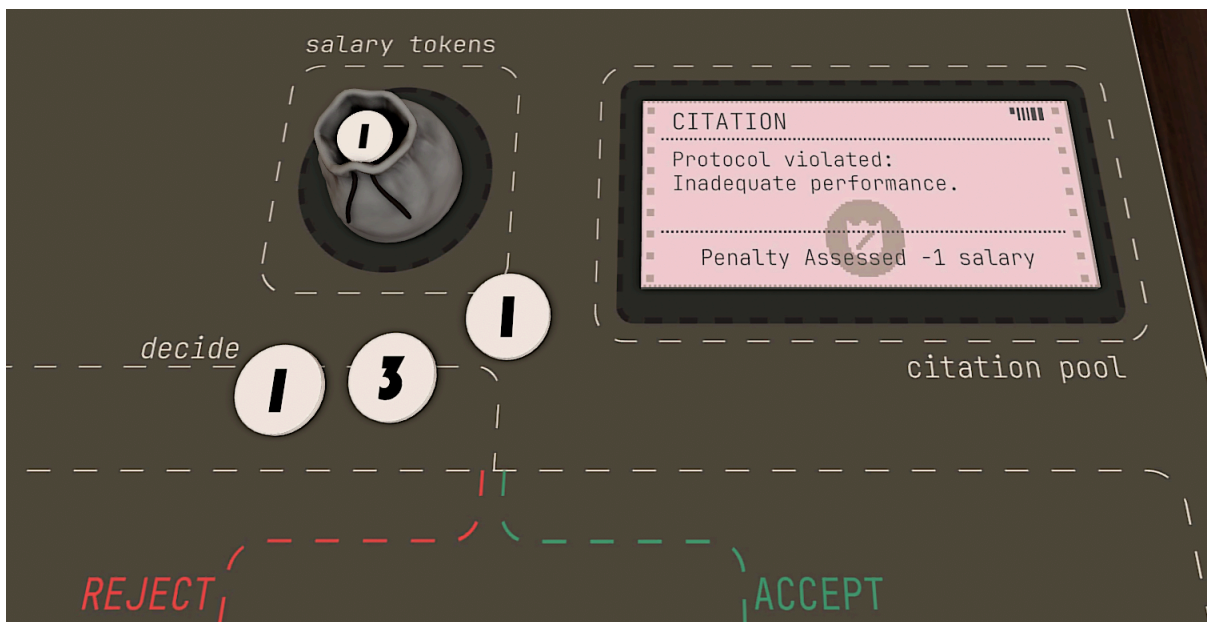
Time Pressure

Time is a crucial element in the game. Initially, we planned to abstract time pressure into resource management pressure by introducing limited-time tokens. Players would need to spend a token for any interaction, symbolizing the passage of time and abstracting the concept of time itself. We thought this idea was brilliant, but testing revealed it didn't work as expected. A player with exceptional memory bypassed the need to spend tokens for rule checks, effectively halting time progression in our design. We realized that resource management pressure and time pressure are fundamentally different, especially impacting players with varying efficiency. Ultimately, we compromised by replacing the time tokens with an hourglass for gameplay.



Score(Punishment)

In the original game, there's a level-based threshold where the player must support their family, requiring the completion of a certain number of tasks correctly to progress. This mechanic leads to tension, pushing players to complete tasks as quickly as possible. Since this mechanic significantly impacts the player experience, we didn't make big changes to it; we simply simplified it. After each correct judgment, the player receives a salary token, while incorrect judgments result in a penalty. At the end of a level, the score is calculated by subtracting the number of penal penalties and salary tokens. Only when the player's score exceeds the threshold score for that level, they can progress to the next level.

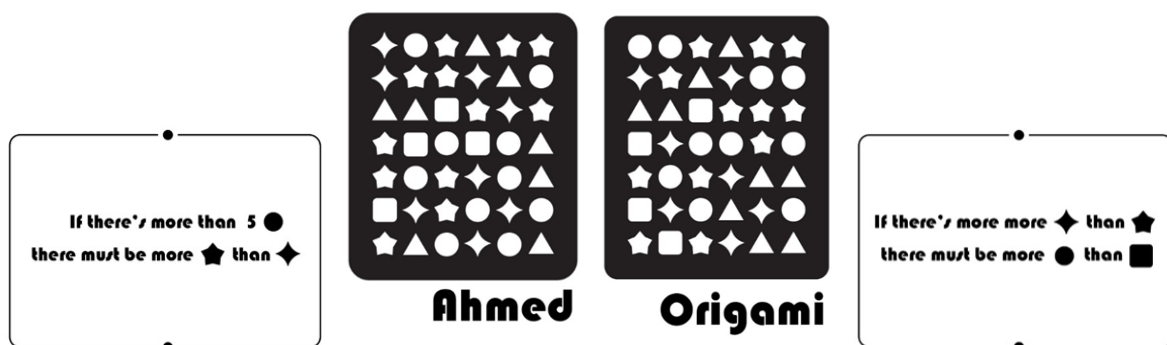


Gameplay

1. Flip the rule cards and memorize the rules for the level.
2. Place the rule cards face down and turn over the hourglass to start the timer.
3. Draw a pattern from the pattern deck for this level(day1/day2) and check if it meets the rules.
4. If a player needs to recheck a rule, they can flip a card, but they cannot touch any other cards; once done, the card must be placed face down again.
5. After judging the pattern, place it in the reject/accept area. The pattern will automatically flip to reveal the correct answer. If correct, gain a salary token; if incorrect, receive a penalty.
6. Repeat steps 3-5 until the timer ends.
7. Subtract the number of penalty slips from the salary tokens earned to calculate the score. The passing score for the first level is 6, and for the second level is 5.

Patterns & Difficulty

For the first level of the game, we began by placing several random shapes on each applicant card, along with some random rules, like this:



However, based on feedback from the first players, we noticed that the initial difficulty was quite high and challenging. We decided to make it simpler and more structured, allowing players to ease into the game without feeling overwhelmed. Because "Papers, Please" starts by having players check very simple things before gradually increasing the difficulty.

To achieve this, we first had to identify all the parameters that influence the difficulty of the game and make a difficulty model.

Our **Target Parameter** that defines the game difficulty is the player score at the end of each level. This score is determined based on the number of applicant cards that the player correctly identifies within a certain time limit.

The **Critical Parameters** that affect the target parameter are as follows:

1- Average Shapes per Card:

This is the average number of all the shapes on applicant cards during one level.

For level one we started by having 20 applicant cards as below:

Card Type	Number of Cards	Rows	Columns	Shapes per Card	Total Shapes
4x4	7	4	4	16	112
4x5	7	4	5	20	140
5x5	6	5	5	25	150
Total	20	-	-	-	402

Therefore, the Average Shapes per Card would be = $402 / 20 = 20.1$

2- Number of Shape Types:

For the first level, we limited the types of shapes to 4 types:

O X Δ \square

3- Required Actions:

This parameter is a quantitative equivalent for the difficulty of the rules, which is a qualitative parameter.

At first, we had two different categories for rules: simple rules and complex rules. Simple rules included one-line rules that involves only one shape, like this:

- The number of Triangles must be odd.

In contrast, complex rules were longer and included more conditions, like this:

- If the number of X's are even, the number of crosses must be more than triangles.

In order to make a difficulty model, we needed to quantify this parameter. As a result, we decided to count the number of required actions for all the rules at each level. By "actions," we refer to the required cognitive processes, such as counting and comparing.

For level 1 we had two simple rules:

- 1- The count of Δ must be odd.
- 2- The count of O must be greater than that of \square .

This requires 6 mental actions as follows:

- 1- Counting the triangles.
- 2- Check if the count of triangles is odd.
- 3- Count the number of circles.
- 4- Count the number of squares.
- 5- Compare these two numbers to see if the first one is greater.
- 6- Make the final decision.

4- Level Time:

This is the time limit for the player to check as many applicant cards as possible. It is indicated by an hourglass timer that the player flips at the beginning of each level after reading the rules. For the first level, the time limit is set to **120** seconds.

In summary, this is the table of critical parameters for level 1 :

Avg. Num of Shapes	Num of Shape Types	Actions Required	Time
20.1	4	6	120

Below are the patterns for the 20 cards. We designed them in a way that based on the two rules in level 1, 50% are valid applicants and 50% are invalid. Of course, this percentage does not affect the game's difficulty and is not part of any gameplay parameters. It was simply intended to create variety in the game's aesthetics and ensure that the player experiences both valid and invalid cards.

4x4 cards:

- Approved:

□OXΔ	□□OΔ	X□□Δ
□□XX	□ΔΔO	ΔΔΔO
ΔOΔO	ΔOΔO	□O□O
ΔXΔO	Δ□ΔO	ΔXOO

- Rejected:

□□□□	□XX□	OΔ□□	Δ□ΔO
ΔOXO	ΔOΔΔ	□XXO	O□□□
X□X□	X□Δ□	XXΔX	XOX□
O□□□	OX□□	Δ□ΔO	XX□□

4x5 cards:

- Rejected:

□△XXO	□□□X	OO△□□
X□OOX	OOOOO	□△X△X
△□□XX	X△XX△	△XX△△
△O△XO	△△△□X	XOX△□

- Approved:

△□△□O	△□□OO	OOX□□	△□△□△
X△□△□	△XX□□	X△X□△	X△X△X
O△XOX	△□XX□	△XX△△	△△△△△
OXO□O	OOOOO	XOXOX	△OOOX

5x5 cards:

- Approved:

OO△△□	OXXO□	□△OXX
△△△△X	△OO△X	□XX△O
△△OOO	X△OOO	□△XXO
△□△△X	△□X□□	X△OOO
X□□O□	X□△O□	XX□△O

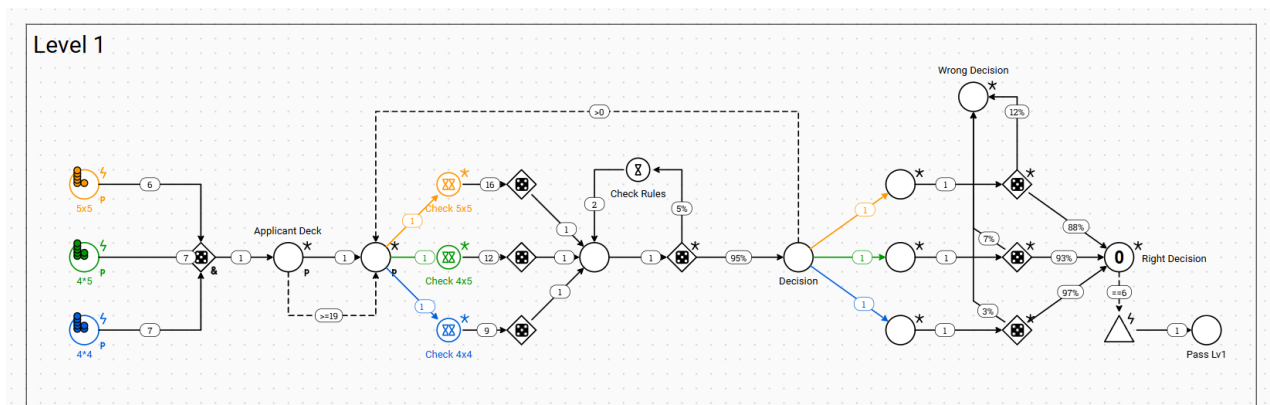
- Rejected:

O□△△△	XOX□△	□△XXO
OX□△O	□△□OX	△□OXX
XO□△X	□O△□□	OO□XO
O□△△△	O□O□O	△△XOO
△O△OX	OO△△X	OOXOO

Machinations & the Second Level

For level 2, we needed a difficulty model that would make the level 30% harder by adjusting various parameters. Rather than using a linear equation with our limited parameters, we decided to create a difficulty model in Machinations to simulate each level over several rounds and provide predictions for future levels, leading to more reliable results. [Here is the link to our model in Machinations.](#)

We first conducted several rounds of playtesting sessions with various players for level 1, measuring details such as the time spent on each card, the number of times they checked the rule cards, and the number of incorrect decisions made for each card (error percentage). We used these playtest measurements as inputs for the Machinations model.



Based on this model, first of all, one card from three possible categories of applicant cards is placed on the table. Then, the card takes a certain amount of time to be checked. We estimated this time for each card based on playtests: 16 seconds for 5x5 cards, 12 seconds for 4x5 cards, and 9 seconds for 4x4 cards. There is a 5% chance that the player will check the rules again, as they might forget. After this, it's decision time. The accuracy of the decision again, depends on the card type: 88% for 5x5 cards, 93% for 4x5 cards, and 97% for 4x4 cards. This process will repeat until the

number of checked cards reaches 20, at which point the round will end. The model will then start simulating the next round, and so on.

Our goal was to determine the values for our critical parameters for level 2. By adjusting different values in the model, we created another model specifically for level 2. We made various changes to see how they would impact the results. Based on our findings, we realized that increasing all the parameters would make the game too difficult. We decided to keep the time limit unchanged for level 2. Also instead of increasing the shape tiles to 6x6 and 7x7, we kept most of the original parameters and only added 5x6 cards in place of 4x4 cards.

Also for the shape types, we only added one new shape and the shapes are now these:

O X Δ \square +

Also we added only one new rule. These were the 3 rules for level 2:

- The number of Δ must be odd.
- The number of O must be greater than \square .
- If the count of X is even, there must be more + than Δ .

cards

In summary, these are the critical parameters for level 2:

Avg. Num of Shapes	Num of Shape Types	Actions Required	Time
24.75	5	11	120

Below are the final patterns for level 2 applicant cards based on our parameters:

4x5 cards:

- Rejected:

XOOXO	ΔX□□X	XXOΔ□
□ΔXOX	+O□OO	Δ□X+O
Δ□O++	ΔΔ+XΔ	Δ+□Δ□
□□Δ+O	O+Δ□X	OXΔO□

- Approved:

Δ+Δ□O	Δ+□+O	OO+□□	+□X+Δ
X+Δ+□	ΔX+□+	XΔXO	+□O+X
OΔXOX	Δ□X+□	Δ	ΔO+ΔΔ
□OΔ+O	O+OOO	ΔX+Δ	+OΔO+
		Δ	
		X+O□X	

5x5 cards:

- Approved:

□O+X+	□+□OΔ	X□+□Δ
Δ+□XX	□XOΔO	Δ+ΔΔO
+XΔ□X	Δ+OΔO	O+□OX
+ΔO+O	ΔXO□+	□O□O+
+ΔXΔO	Δ□XΔO	Δ+X+O

- Rejected:

□□Δ□□	□X+X□	Δ+ΔΔO	Δ□Δ+O
+ΔOXO	ΔOΔ+Δ	++□OX	OOO+O
X+OO+	XOΔ++	□□□O+	XOX+□
ΔΔΔ+□	ΔX+XO	Δ+X+O	XXΔΔΔ
OO+OO	OX□+□	X□+□Δ	□ΔX+□

5x6 cards:

- Approved:

O△+X△O	O++OX□	□△OOXX
△+O+△X	△++O△+	□X+△+O
△X△+□O	X△O+OO	□+O+XO
△O□□OX	△□+X□□	X++O□O
X□+□O□	X□△+O□	X+□O△O

- Rejected:

O□△+△△	XOX+□△	□+XX□O
OX□+△O	□△+□OX	△□OX+X
X+X+□△	□+△+△□	OO+□XO
++O△△△	O□O+□O	△X△XOO
△O+△OX	O+O△△X	O□OXOO

Playtest

This section contains the notes we made during all the playtest sessions conducted.

1st playtest

Game Version: Hand-drawn prototype

Purpose: Check if pattern-checking mechanics make sense

Number of Players: 1

Player Type: Designer

Notes:

- Pattern-checking mechanics make sense. It just works.

2nd playtest

Game Version: Laser cut prototype

Purpose:

- Check if the graphics design looks good
- Check if the gameplay delivers the intended aesthetics
- Check if the game is unplayable due to difficulty
- Check accessibility issues (pattern size, readability, etc.)

Number of Players: 1

Player Type: Designer

Notes:

- The graphics look great and need polish, but good direction; people liked them
- The gameplay checks out, but it feels like Papers, Please
- Difficulty is playable but much more difficult than expected
 - Harder to remember the rules
 - Rules and the number of rules have a DRASTIC impact on difficulty
- The 6*7 Pattern can be tricky to read due to size and color

3rd playtest

Game Version: Laser cut prototype

Purpose:

- Gather feedback from the group
- Check turn-based and resource-based time pressure mechanics

Number of Players: 2

Player Type: Designer

Notes:

- Graphics looks good
- Pattern checking is good
- Patterns need meaning (?)
- Time mechanics works but needs work
- Needs a scoring system
- Needs a validation system

4th playtest

Game Version: TTS Prototype v0



Purpose:

- Check if the designs that were intended for a physical prototype work in TTS
- Check if the gameplay delivers the intended aesthetics in TTS
- Check accessibility in TTS

Number of Players:1

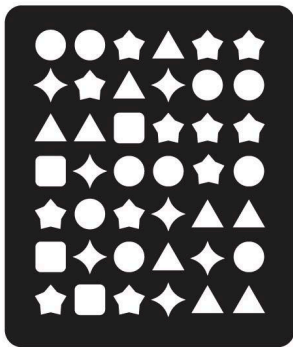
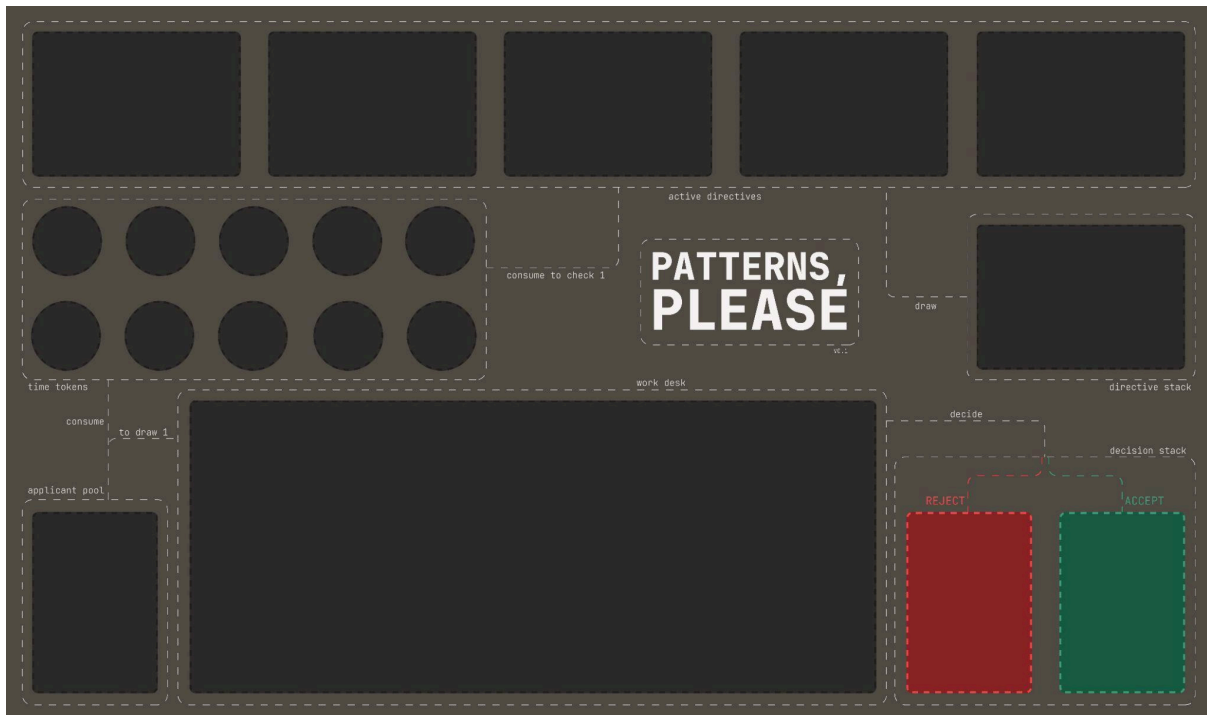
Player Type: Designer

Notes:

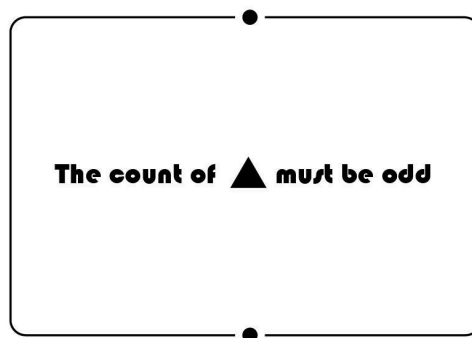
- Graphics looks good
- Loss in tactile feedback is mitigated by the satisfying animations and sound effects in TTS.
- Potential readability issues with applicant cards

5th playtest, Board Design/Dynamics

Game Version: TTS Prototype v0.1



Origami



Purpose:

- Check if the board design works
- Check accessibility issues
- Check if the dynamics of the game are as expected
- Check if the game delivers the intended aesthetics

Number of Players:1

Player Type: Classmates

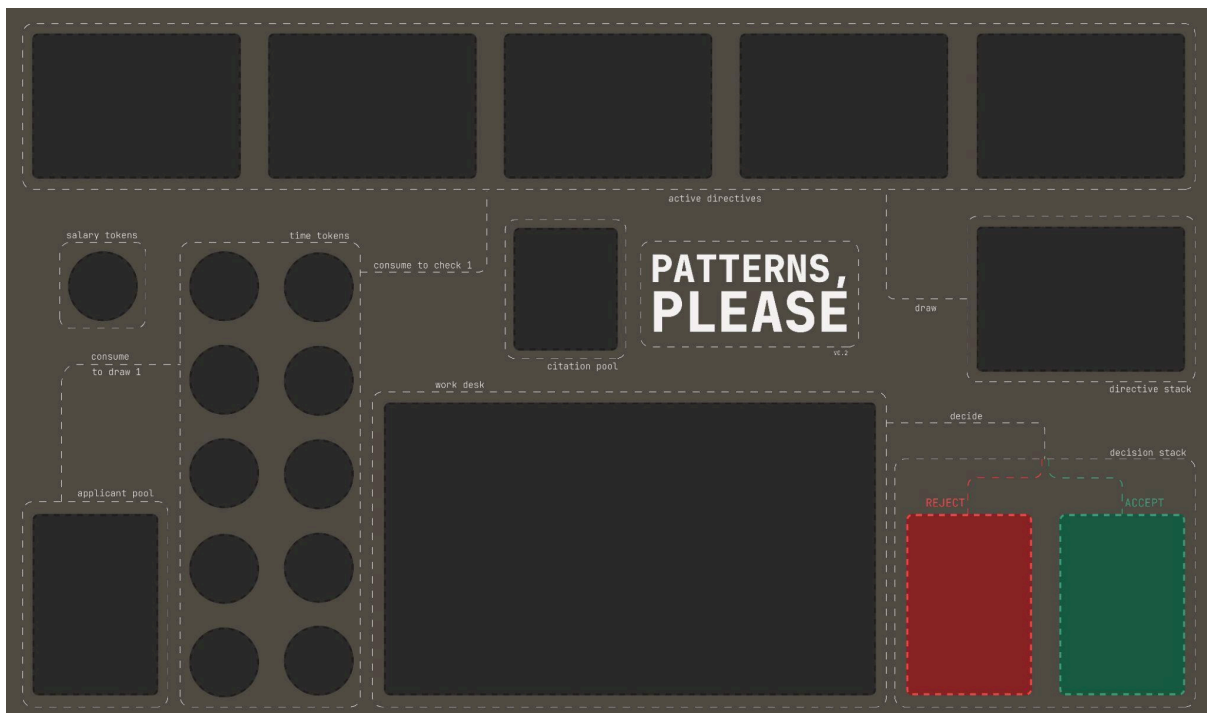
Notes:

- Did NOT deliver % of the intended aesthetics The player was really good at memorization, bypassed a lot of mechanics. Produced a lot of boring dynamics.
 - Did not have to check rules with time tokens - No time pressure

- Spend A LOT of time counting patterns - Not engaging
- Usability issues:
 - Very easy to forget flipping time tokens, leading to unintended cheating
 - Time tokens are too big, taking up a lot of board space
 - Accessibility
 - Patterns are small and has readability issues (increase size and margin)
 - I couldn't see them but the player sounded like they were struggling to read the symbols
- Player comments:
 - A morality system would be nice.
 - Could do fixed rules or dropping the abstract patterns completely
- I personally struggled not to intervene to "save" the game and just let the game be completely destroyed by the play tester...

6th playtest, Board Design

Game Version: TTS Prototype v0.2



Patch Notes:

- Moved time tokens in between applicant cards and work desk. Players have to move past the time tokens to draw applicant cards, reminding them to flip the tokens.

Purpose:

- Test if the revised board design encouraged token flipping

Number of Players: 2

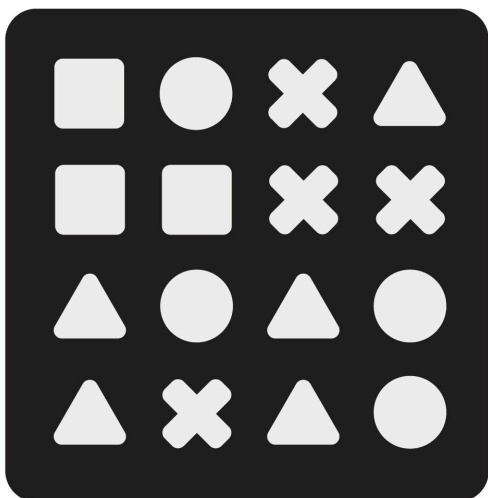
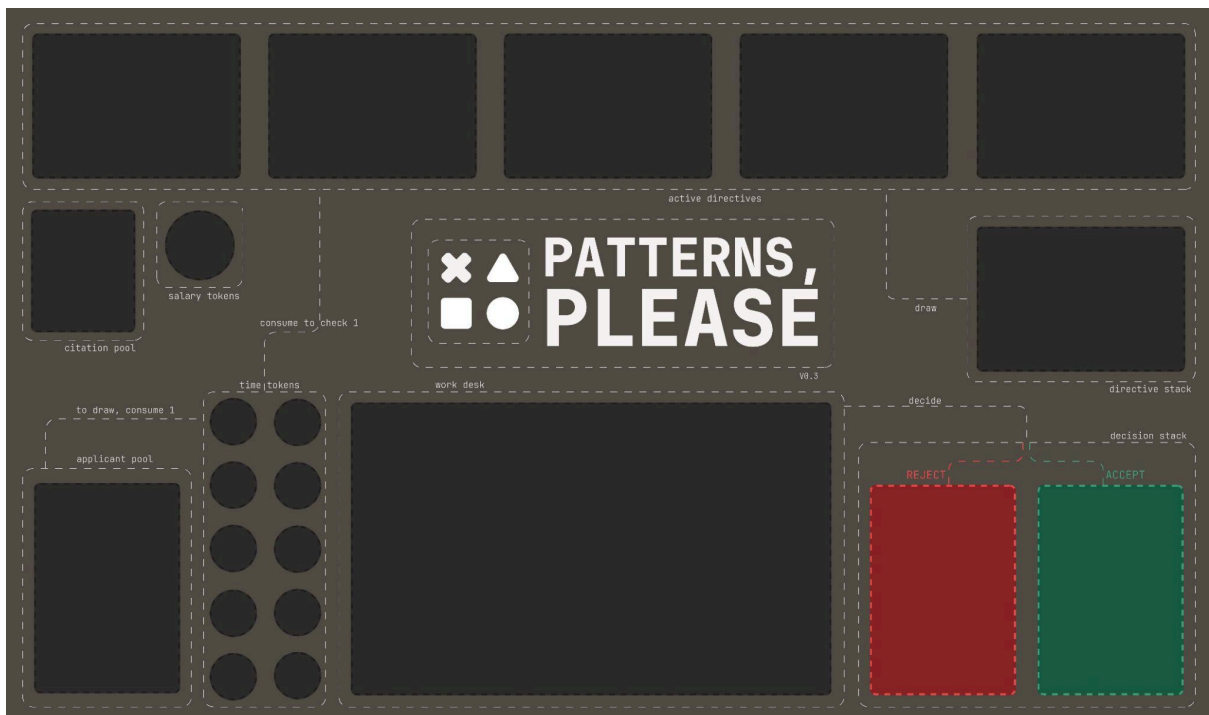
Player Type: Designer, Casual Player

Notes:

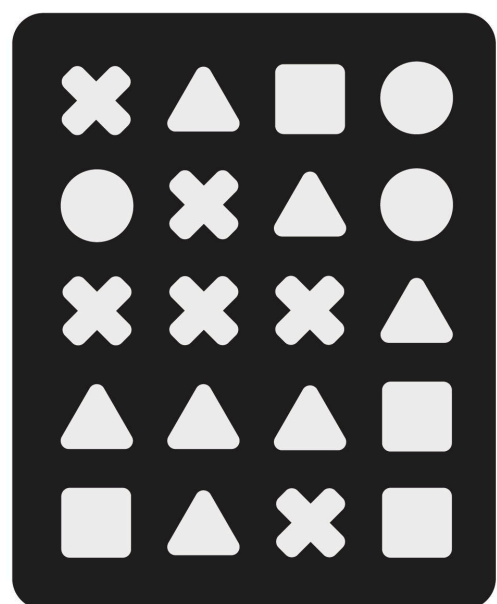
- It did.

7th playtest, Board Design

Game Version: TTS Prototype v0.3



Susie



Estelle

Patch Notes:

- Reduced the size of the time tokens
- Reduced the size of the work desk
- Increased the size of the applicant cards
- Implemented the 2.0 Applicant patterns designed by Sadaf
 - Revised the design of the Applicant cards' design to be more readable
 - Increased symbol size and margin
 - Reduced symbol count
 - Updated to use the color palette
- Added Salary Tokens
- Added a place holder for citations
- Reorganized board elements to be more visually pleasing

Purpose:

- Test if the revised designs led to better accessibility and usability

Number of Players: 2

Player Type: Designer, Casual Player (EXTREMELY near sighted)

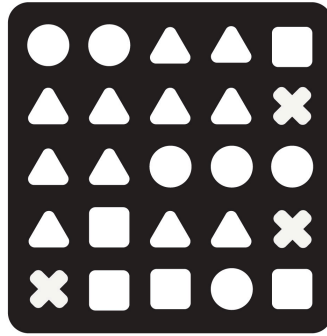
Notes:

- Applicant cards much more readable, more visually pleasing. However, I still saw the play tester moving closer to the screen when presented with a 5x5 pattern card.
- Funny game name
- Needs validation system ASAP

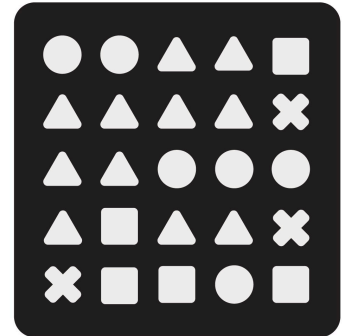
8th playtest, Board Design, Validation system



Michael



Syrah



Syrah

INVALID
APPLICANT

VALID
APPLICANT

Game Version: TTS Prototype v0.35

Patch Notes:

- Increased the size of the Applicant cards further, and reduced the size of work desk to accommodate
- Revised the 5x5 cards
 - Smaller but more distinct symbols (decreased edge radius)
 - Increased spacing and margins
- Added validation notes (valid applicant, invalid applicant) to the back of the cards

Purpose:

- Test if the revised designs led to better accessibility and usability
- Test the validation system

Number of Players: 2

Player Type: Designer, Casual Player (EXTREMELY near sighted)

Notes:

- Applicant cards look good.
- Validation system is very clunky
 - When card is dropped into the decision pile, flipping it flips the whole deck so the back of the card is still not visible
 - Flipping the card before dropping it into the decision pile is not an appealing and immersive dynamic
 - The player had to do almost a QTE to flip the card before it fell onto the decision pile. An unintended "subgame" that detracts from the intended aesthetics.

9th playtest, Board Design, Time system

Game Version: TTS Prototype v0.35t

Patch Notes:

- Revised time mechanics
 - Removed time tokens
 - Introduced a customizable hourglass with alarm sound

Purpose:

- Test if the new time mechanic addressed the problem discovered in playtest 5
- Test if the new time mechanic produced more engaging dynamics that are closer to Papers, Please

Number of Players: 3

Player Type: Designer, Classmate, Casual Player (EXTREMELY near sighted)

Notes:

- Hourglass is fun to use and produced more engaging dynamics
- Plays closer to the actual game
- Would be nice to do playtest again with the tester who broke the game
- Need to fix validation system ASAP

10th playtest, Board Design, Validation system

Game Version: TTS Prototype v0.36t

Patch Notes:

- Added a function in global scripting to flip the Applicant cards over automatically once it has snapped and fell onto the decision pile.

Purpose:

- Test if the script works
- Test if the validation system is easy and fun to sue

Number of Players: 2

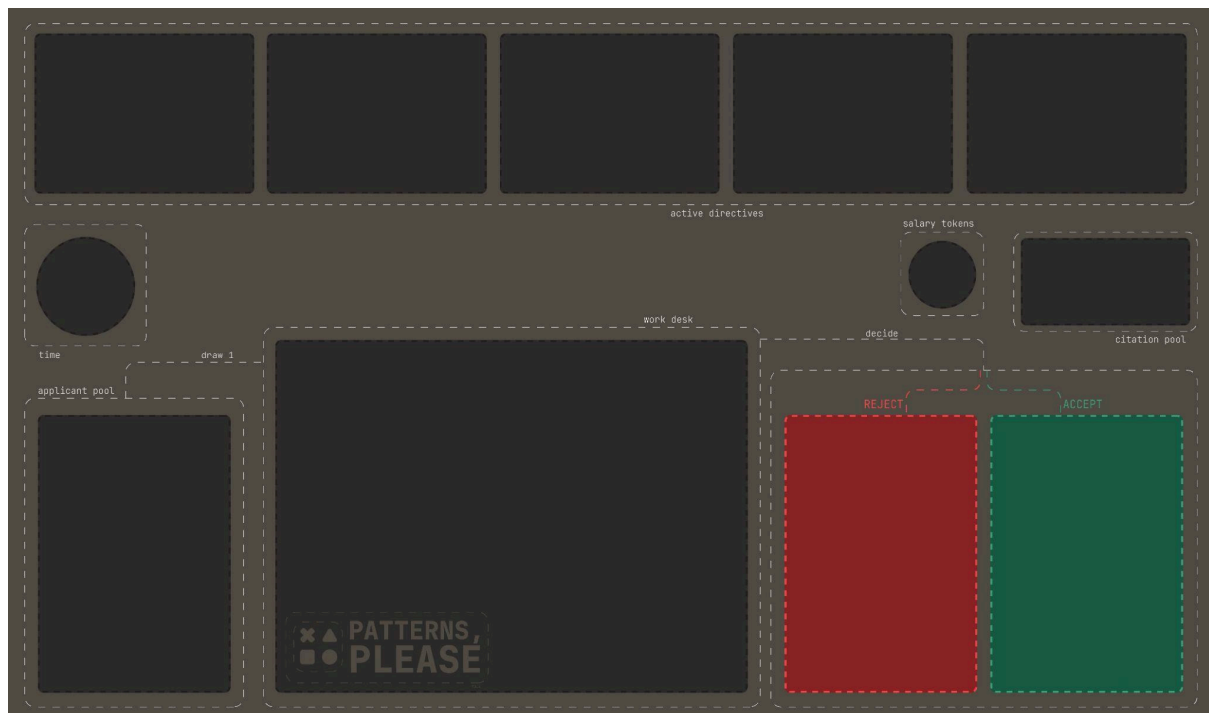
Player Type: Designer, Casual Player (EXTREMELY near sighted)

Notes:

- Validation system is good.
 - Script could be buggy, watch (unintended flips)

11th playtest, Board Design

Game Version: TTS Prototype v0.4t





Patch Notes:

- Revised Applicant Cards:
 - Fixed a few validation errors
 - Revised font size
 - Added sob stories to some of the cards
- Added Citation Cards
- Changed "Directives" to "Protocols" for the Rule Cards
- Removed "Directive Pile" to reflect the new fixed rule system
- Reorganized and resized items to prioritize accessibility over aesthetics
 - EXTREMELY HARD FOR ME TO DO :(But as Maddy Thomson so beautifully put: sometimes you just need to let go.

Purpose:

- Test if prototype is ready for larger scale playtests

Number of Players: 2

Player Type: Designer, Casual Player (EXTREMELY near sighted)

Notes:

- Prototype is ready for larger scale playtests
- Needs to finish implementing the manual

12th playtest

Game Version: TTS Prototype v0.4t & v0.4

Purpose:

Test the usability and difficulty of the game.

Number of Players:

Player Type: Teammate, Classmate

Note:

- The effect of the hourglass is indeed better than the time token.
 - I believe the reason is that, when players perform a check, there is no way to forcefully collect the time token from them, which makes its effect not proportional to the flow of time.
- The complexity of the pattern cannot produce a qualitative change through quantitative increases. The number and difficulty of the pattern shapes are not directly proportional.
 - I think the reason is that the impact of complexity involves multiple factors, as mentioned in the difficulty document. Do we perhaps need a more precise expression? I think we might want to refer more to the section in the assignment description on "Select the critical parameters for your game."

13th playtest

Game Version: TTS Prototype v0.4t & v0.4

Purpose:

Test the usability and difficulty of the game.

Number of Players: 3

Player Type: Classmate

Note:

Result: This is the result of accuracy played by each player.

Categorized with different card types.

Player 1 Level 1 (Memory Version)

4 X 4 : 3/3 (right/total)

4 x 5 : 2/3

5 x 5 : 3/4

Player 2 Level 1 (Memory Version)

4 X 4 : 3/4

4 x 5 : 4/4

5 x 5 : 2/2

Player 3 Level 1 (Time Version)

4 X 4 : 2/3

4 x 5 : 3/4

5 x 5 : 2/5

Seemed for only two rules, the shapes number won't influence much on accuracy. For each type 4x4, 4x5, 5x5, the mistake number is all 1. However, because of the different total number of each type, the possibility will be slightly different, but in general it doesn't change too much.

The hourglass in the playtest is more important than we thought. Without hourglass, the players basically won't make mistakes no matter what type of shapes number. However with the hourglass they would make more mistakes on 5x5 because they had time limits.

Also for the elements in the rules, the result shows that the shapes included in a particular rule influence most. Because during the checking process, the shapes will change into numbers in players' brains. If the rule only includes 1 shape, then they will only remember 1 number. If 2 shapes then they will remember 2, etc.

Then the other thing that influences the difficulty is the shape of the whole panel. Because players basically filter out the shapes that the rule needs from a bunch of shapes, so an irregular shape such as a rectangle (4x5) is easier for players to recognize, while a square is not.

14th playtest

Game Version: TTS Prototype v0.5

Purpose:

Verify the difficulty model.

Number of Players: 4

Player Type: Classmate

Note:

- The difficulty model worked great with some caveat
 - The prediction for the second model seems to be spot-on
 - Numbers were determined with a math model and the first time playing
 - The prediction for the first level is way too optimistic
 - Numbers were determined using our own gameplay data.
By the time we have played the game dozens of times,
- Revised the model for the first level and changed the target score.

15th playtest

Game Version: TTS Prototype v0.5

Purpose:

Verify the difficulty model.

Number of Players: 1

Player Type: Friend

Notes:

Result: Player 1 Level 1

4 X 4 : 3/3

4 x 5 : 3/3

5 x 5 : 3/4

Player 1 Level 2

4 X 5 : 3/4

5 x 5 : 0/1

5 x 6 : 1/1

From the player's feedback, he mentioned the color problem. He thought the color was not so beautiful and it would interfere with him checking the shapes, especially in level 2.

Also from 2 players' feedback, rule 3 in second level is a little bit confusing. Both of them mentioned that they didn't understand if X is even, then..., because they all asked what if X is odd, what should they do?

Appendix

First Draft of the Difficulty Model

There are many factors which will influence players accuracy of checking cards, such as:

Number of shapes

Number of shapes' types

Number of rules

Number of shapes which includes in a particular rule

Different shapes of the panel

To simplify, we will make a table based on the accuracy of different cards under different rules.

Possibility of checking each person rightly (P)			
Rules Number	2 Rules	3 Rules	Possibility of drawing a particular type of cards in each level.
Shapes			
4 × 4 (P1)	80%		Q1
4 × 5 (P2)	70%	60%	Q2
5 × 5 (P3)	50%	50%	Q3
5 × 6 (P4)		40%	Q4

These are the estimated values based on several playtests.

Because we include different types of cards in a particular level, we can estimate the expected value of right checking n cards by players in this way (because of Hypergeometric distribution) :

$\sum_{i=j}^k n \cdot P_i Q_i$, which j to k is the different type of shape included in the level.

To simplify, we can assign P to this value:

$$P = \sum_{i=j}^k P_i Q_i$$

There are many factors that will influence the cards number checked by players, such as different pattern sizes the invalid card numbers (because if the player quickly finds 1 rule is wrong, for example, the triangle is not odd, then the check time will be fast), and the rules number, we will still provide a form to simplify this situation.

Rules number	2 Rules	3 Rules
Expected cards checked by players	10	8

Expected Value of Score each day (X) equals to:

$$X = n \cdot P$$

If we assume the score needed to enter the next level is T, then here is some difficulty criteria proposed by me:

Difficulty (D):

$$D = T/X$$

When $T = X$, $D = 1$, which means the expected value of the score each day equals the

score to the next level. In this situation, the difficulty is neither hard nor easy. When D is below one means that this level is easy and when D is above one means this level is hard.